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**Arizona Technical Comments**  
**on**  
**Proposed California Regional Water Quality Control Board Orders R7-2004-0100, R7-2004-0103, and R7-2004-0080 and the PG&E Topock Project**  
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September 9, 2004

This memorandum provides supporting documentation and information for our 12 primary concerns which are listed in a letter from ADEQ Director Steve Owens to Mr. Philip Gruenberg, Executive Officer of the California Water Quality Control Board (CRWQCB) Colorado River Basin Region 7.

In addition to the 12 primary issues identified in the letter from Director Owens, Arizona wishes to express disappointment to hear that PG&E is evaluating POTW's in Arizona, California and Nevada as potential recipients of the extracted Cr<sup>6</sup>-containing groundwater. In many cases the POTW's may not be permitted for the addition of this industrial waste stream into plant influent.

The POTW's may also have less stringent effluent discharge limits for discharge to the Colorado River that are not suitable for an industrial source. If less stringent discharge standards are applied, this in effect allows PG&E to put their problem in someone else's backyard and potentially allows the discharge to go back to the Colorado River with less regulation of discharge quality than provided in the three CRWQCB orders. ADEQ recommends that the CRWQCB and DTSC work together to limit options for disposal that involve off-site POTW's from current and future consideration.

### **Arizona Hexavalent Chromium Data for Groundwater**

Both the East and West Raw Water wells that are used to supply water for the El Paso Natural Gas Mohave-Topock plants were sampled through-out the month of July 2004 (**Table 1 – Attached**). Sampling results indicate that Cr<sup>6</sup> and total chromium are both present above detection levels in both water supply sources used by EPNG. It is important to keep in mind that the supply wells used by EPNG are not designed as monitoring wells and are screened over larger intervals rather than discrete zones (such as the zone above the Red Fanglomerate). For example, well 531890 used by EPNG is 720 feet deep and is screened from 174 to 703 feet (ADWR 55 database). **This means that actual concentrations of hexavalent chromium in Arizona aquifers may be significantly higher than the July 2004 results suggest.**

A Background Study is planned by PG&E to assess whether Cr<sup>6</sup> concentrations detected on the east side of the Colorado River represent naturally occurring Cr<sup>6</sup>. Cr<sup>6</sup> has been found to be naturally occurring at low concentrations in areas of California and Arizona. Given the possibility of hydrologic communication between aquifers on either side of the Colorado River these concentrations *may also* represent the leading edge of a plume that has moved beneath the river and is moving above the surface of the red fanglomerate on the Arizona side of the Colorado River (this is especially possible, in light of the fact that EPNG reports no history of using chromium compounds at its Topock facilities). Since the eastern edge of the plume has not been delineated, at this time no conclusions can be drawn and that worries ADEQ.

The possibility of connection between aquifers in California and Arizona must be evaluated through future efforts. Very little is currently known about the aquifer on the Arizona side of the River or about groundwater gradients or aquifer properties. It is appropriate for PG&E to begin to address the possibility of a plume that has reached into another state: Arizona.

Efforts on the Arizona side of the River should include installation of nested monitoring wells that are screened to intersect discrete zones – such as the zone at the contact of alluvium with the Red Fanglomerate. If the Red Fanglomerate is fractured, monitoring wells may need to extend deeper into this formation.

Recent findings in Arizona are cause for the State of Arizona to have heightened and valid concerns which should be addressed and that pertain to the efforts made by PG&E to study and remediate the PG&E Topock Compressor Station plume. We recognize that additional site characterization is not the purpose of these three orders which pertain to an emergency action – Interim Measure No.3, but we wish to go on record regarding plume delineation given the recent and re-occurring detection of Cr<sup>6</sup> in the Arizona aquifer across from the PG&E site.

### **Time Limit for Orders No. R7-2004 0100, 0103, and 0080 (Permit Expiration Date)**

Work for Interim Measure No. 3 has been rapidly driven forward under a CEQA exemption granted by DTSC and as a result, normal studies have not been conducted prior to moving forward with “emergency” interim remedial actions. ADEQ strongly urges California (the CRWQCB) to consider issuing orders that are for a limited duration. The Notice of Exemption (NOE) issued by DTSC on June 30, 2004 was based on two key documents – June 30, 2004 correspondence from Karen Baker of DTSC *Approval with Conditions, Interim Measures No. 3, dated June 21, 2004 Pacific Gas and Electric Company Topock Compressor Station, Needles, California* (EPT Id No CAT080011729) and July 8, 2004 correspondence and attached report from Yvonne Meeks of Pacific Gas and Electric Company *Project Description, Interim Measure No. 3 – Revision 1, PG&E Topock Compressor Station, Needles California*. The July 8, 2004 response to the *Approval*

*with Conditions* letter contains projected pumping rates from 2004 through March of 2006. ADEQ believes that these documents and the NOE reflect the intended short-term nature of Interim Measure No. 3.

Two of the orders proposed by the CRWQCB contained ***no expiration dates*** (0103 and 0080) and did not reflect that this is a short-term project (Interim Measure No.3). The third order (0100 for NPDES discharge) contained an expiration date of 5 years after issuance – standard for NPDES permits. The State of Arizona respectfully asks the CRWQCB to revise the Fact Sheet and all three orders to reflect an interim measure of limited time span. The documents referenced above on which the NOE was granted suggest that *two years* is an appropriate time span for permit duration.

ADEQ has taken the position that facilities on the Arizona side of the river will not be allowed to discharge detectable chromium to the river based on significant public response and inquiry regarding public safety, including significant interest from Tribal Nations. We are currently negotiating with EPNG with respect to this matter for the Mohave-Topock Compressor Station which is using raw water containing Cr<sup>6</sup> and further concentrating the water containing Cr<sup>6</sup> during cycling in their processes.

We support a less stringent approach for the PG&E Topock Interim Measure No. 3 with the understanding that Interim Measure No. 3 is a *short-term emergency project* and will not evolve into the final remedy for the PG&E Topock project without proper feasibility studies, environmental impact studies, cultural studies and a complete remedial investigation that assesses the possibility of hydraulic connection between aquifers in California and Arizona. We request that the State of California make certain that these detailed studies are done.

ADEQ likewise encourages DTSC to look at the time line for the CEQA exemption and its longevity and intent to ensure that proper studies are done by PG&E and that a short-term solution does not become a long-term one without necessary, critical intermediate steps.

### **Overall Contingency Plans**

**Plant Upset Conditions** - *The entire success of Interim Measure No. 3 hinges on the treatment system function, system performance and capacity.* While there are multiple discharge choices for the treated, extracted groundwater (reflected in the 3 orders), all choices rely on the same treatment plant to achieve effluent limitations for the treated groundwater set by the orders. ADEQ strongly encourages DTSC, CRWQCB and CAL EPA to require PG&E to develop contingency plans in the event of treatment system plant upset conditions.

Presently in the event of plant upset, there appears to be no plan in place for where extracted groundwater will be directed. If plant upset conditions occur, then extracted groundwater will be untreated and data suggests the extracted groundwater will consist of approximately 190,000 gpd of hazardous waste containing Cr <sup>6</sup> at average concentrations up to 500 to 700 ppb, or more.

The current off-site disposal method uses tanks that are hauled to Los Angeles as hazardous waste. This is very taxing to PG&E and apparently to contractors also (as reported in CWG meetings), at a much lesser rate of 20,000 gpd. How will 190,000 gpd be handled? What is the contingency for managing this situation for Interim Measure No. 3?

**Treatment System Performance Objectives Not Met** – Contingency Plans should also be required and developed in case initial discharge characterization data suggest that the treatment system does not achieve the required effluent limitations. If treatment performance standards are not achieved by the treatment plant, there appears to be no back-up plan for additional or augmented treatment, or off-site disposal for 190,000 gpd of untreated groundwater containing chromium.

**Need for Increased Pumping Rates** - Contingency Plans should be required and developed in the event that initial data suggests that pumping rates must be increased above 132 gpm for reversal of the groundwater gradient (and plume) away from the river during low River water levels. Interim Measure No. 3 is currently limited by the 132 gpm treatment capacity of the proposed treatment plant. What will be done to handle the additional 70-some gpm currently allowed by the order to accommodate such a need? Again, ADEQ encourages the CRWQCB to take a close look at this issue prior to approval of the orders and amend the orders as needed to address this concern.

**Surface Impoundment Parallel Track** – ADEQ requests that DTSC and PG&E immediately assess the feasibility of installing a back-up surface impoundment for temporary containment during plant upset conditions that can be up and operable for the next season (2005-2006) of low River elevations.

**Contingency Plan for Re-injection** – ADEQ requests that a contingency be required and developed for the event that re-injection and mounding affect the plume configuration or adversely impact the Piute Hydrologic Unit and/or comparable Arizona aquifers.

**Contingency Plan for Exceeding Normal Liner Leakage Rates** – ADEQ suggests that the CRWQCB add contingencies to Order No. R7-2004-0080 for the event that “normal liner leakage rates” as measured in the LCRS sump of each impoundment is exceeded. The monitoring plan should include liner leakage rate assessments based on LCRS collection sump volume monitoring.

### **Standard Provisions for Orders R7-2004-0103 and 0080**

Standard provisions were found for the NPDES related order (0100) which pertains to discharge to the Colorado River but similar provisions were not found by ADEQ for the two other orders (re-injection and reuse in the cooling towers).

Terms such as “upset” should be defined for all orders and standard conditions and provisions should exist for each order, since each order may be implemented independently of the other orders.

### **Proposed Order R7-2004-0100: NPDES discharge of Extracted Groundwater to the Colorado River**

#### **FACT SHEET**

The fact sheet does not explain how reasonable potential for an exceedance of a standard was determined. From the monitor well data given in the *Groundwater and Surface Water Monitoring Report, Second Quarter 2004*, it appears that other parameters (particularly arsenic and antimony) may have Reasonable Potential/Probability and should be included as effluent limitations in the Order.

**Standard Provisions (2.) Duty to Reapply** – This provision refers to a permit expiration date which was not found in two of the three orders or related documents which were provided to ADEQ. Please add expiration dates to all three orders which reflect the short-term duration of Interim Measure No. 3.

#### **Monitoring and Reporting Program for R7-2004-0100 (separate document)**

**Monitoring Item (3) – Sample collection location.** ADEQ requests that the order specify the actual sample collection location – either at the end of the outfall pipe if it is not submerged in the Colorado River or at the point of discharge from the groundwater treatment plant.

**Treatment Facility Start-up Phase and Reporting (2) (d)** – last sentence, we suggest that the following phrase be added to the end of the sentence, “and the effluent shall be held in the tank or disposed off-site until such time as effluent quality meets effluent limitations.”

## **Groundwater Treatment System Influent**

**A. Groundwater Treatment System Influent** – Add the Phrase (Extracted Groundwater) after the title to make clear what “influent” is.

**Constituents** - ADEQ requests that the following constituents be added to the groundwater treatment system influent monitoring list for consistency and to allow full assessment of changes to chemistry of treated water: Antimony, Arsenic, Beryllium, Cadmium, Mercury, Selenium (important in relation to impairment of the Colorado River), Silver, Temperature and Thallium.

**Monitoring Frequency** Foot note 3. Given the short term duration of this project and the importance of consistently assessing performance objectives, ADEQ requests that after start up Total Chromium and Hexavalent Chromium be monitored on a weekly basis for the duration of the project. Information pertaining to incoming concentrations of all forms of chromium is especially necessary to assess performance of the treatment system.

## **Groundwater Treatment System Effluent**

**B. Groundwater Treatment System Effluent** – add the phrase to the title (Treated Groundwater Prior to Disposal/Discharge) to make clear what “effluent” is being sampled.

**Constituents** - ADEQ requests that the following constituents be added to the monitoring program: Antimony, Arsenic, Beryllium, Cadmium, Mercury, Selenium (important in relation to preventing impairment of the Colorado River), Silver, Temperature (important to ensure that Receiving Water Limitation B.1.H of this order is met) and Thallium.

The Waste Disposal Report provides a range of temperatures expected in the effluent for summer ranging from 80-85°F and winter ranging from 55 to 60°F.

River temperatures reported for the February 2003 River Sampling event ranged from 56.39°F to 58.9°F. Other river temperature data has not been reviewed by ADEQ. The limited data reviewed by ADEQ suggests that the WDR projected temperature range for the effluent is consistent with February 2003 winter sampling event results. It is important, however, to continue to verify through monitoring that the effluent temperature continues to remain in acceptable summer and winter ranges during Interim Measure No. 3.

*Arizona regulations (Arizona Administrative Code (A.A.C.)) R18-11-109.C requires that the temperature of the receiving water (the Colorado River especially) not increase more than 3 °Celsius due to thermal discharge. This is more conservative than the Water Quality Control Plan for the Colorado Basin Region 7 which protects beneficial uses with respect to temperature changes*

from discharges. ADEQ requests that the Arizona standard be considered by the CRWQCB, given that the receiving water extends across state boundaries. We request that a temperature range for winter and summer be added to Effluent Limitations.

**Frequency (footnote 7)** – ADEQ requests that after system startup monitoring of the discharge continue on a weekly basis for the duration of the orders/Interim Measure No.3. This is important to make sure that averages and Maximum values are not the same and determined by just a single monthly sampling point. The frequency should not be reduced until the performance capabilities of the treatment plant have been clearly established and documented based on data submitted to both DTSC and the CRWQCB. At least one year of data should be obtained prior to reducing the monitoring frequency.

## **Receiving Water Monitoring**

**General Comment** - For clarity section should be clearly labeled *Receiving Water Monitoring (Colorado River)*.

**Station(s)** – This should clarify that both of these stations are located in the Colorado River. ADEQ is unsure why R-1 is required, since this appears to be an up gradient location. If station R-1 remains, it should be identified as a Background Sampling Location or further defined as an up gradient “eddy” monitoring point, if that is what it is. The Fact Sheet should also explain this.

**Outfall** – ADEQ suggests that the discharge from actual outfall pipe be sampled.

**Sampling Frequency for Footnote 9** – ADEQ recommends/requests that River sampling for total chromium and hexavalent chromium occur on a weekly basis (after startup has ended) for the duration of the permit/Interim Measure No.3.

**Sampling Constituent List** – ADEQ requests that the following constituents be added to this monitoring list for consistency: Beryllium, Selenium, and Temperature. Selenium is important because data for the River and the draft 2004 303(d) list indicate that some reaches of the Colorado River are impaired with respect to Selenium and other reaches require additional assessment. Further, the CA Toxics rule contains a standard for selenium.

Temperature information pertaining to Arizona regulations was presented above in this document with a request for adding a temperature effluent limitation. It is important that PG&E perform temperature monitoring in the *Receiving Water (the Colorado River)* to assess if impact is occurring that may affect beneficial uses.

**Statement “In the event that no effluent is present at Station R-1, no receiving water monitoring data is required for Station R-1” (page 6)** – ADEQ suggests that this be re-written to clarify the intent. Is R-1 an up gradient or background sampling location or has it been added for the eventuality that the outfall is positioned where there is an eddy present in the River - resulting in up stream flow (such as occurs at the El Paso Natural Gas Mohave-Topock outfall)? Please clarify this portion of this order.

**Effluent Toxicity Testing** – ADEQ uses an action level of 1.6 TUc for daily maximum toxicity values. ADEQ requests that the CRWQCB consider this action level for this order.

### **Order No. 0100**

**Items (24 and 25) -200 gpm Discharge Rate vs. Plant Treatment Capacity** – The order allows up to 200 gpm for discharge. It is important to limit NPDES discharge to the capacity of the treatment system - which is currently 132 gpm, as proposed by PG&E or to require PG&E to provide additional treatment or off-site disposal capability within 30 days of order signature (see next paragraph). This is critical since exceeding this rate without stepped up treatment would result in discharge of untreated groundwater to the Colorado River.

(24) The current language in the order reads, “The discharger proposes to discharge a maximum of 200 gpm of treated Reverse Osmosis permeate to the Colorado River.” This sentence should be revised to reflect what is currently proposed, “*The discharger proposes to treat 132 gpm of extracted groundwater through reduction with ferrous chloride, reduction, and reverse osmosis and discharge the treated groundwater to the Colorado River.*” And perhaps to add, “*The discharger may increase the rate, not to exceed 200 gpm, if additional treatment capacity is added and treatment performance capabilities are demonstrated to the CRWQCB and DTSC.*”

(25) The order reads “The facility is designed to extract and treat 200 gpm of contaminated groundwater.” **This statement is inaccurate** based on the On-board Review meeting notes and information provided in the Consultative Workgroup meeting on August 19, 2004. **The facility is only designed to treat 132 gpm.** ADEQ asks that the discharge rate be limited to 132 gpm until such time as PG&E demonstrates sufficient treatment capacity for 132 gpm and that the rate not be expanded beyond 132 gpm until additional treatment capacity is added to the system (or off-site disposal capacity). This affects Item 24 (on page 3 of our copy which was transmitted to us by email). We ask that the RWQCB revise both (24) and (25) to reflect the actual *treatment capacity* of the system of 132 gpm.

**Item (25), page 3.** This same comment applies to the 200 gpm in this provision. ADEQ appreciates that the RWQCB wishes to provide PG&E with a comfort factor in the event that additional extraction is needed to control the plume and supports this decision and is supportive of flexibility. This however, cannot be done without a parallel increase in the treatment capacity



of the treatment plant or off-site disposal capability. ADEQ requests that this provision be amended to state that the discharger/permittee “shall not discharge at a rate exceeding 132 gpm (the treatment plant capacity) until such time as additional treatment capacity has been achieved for an increased extraction rate and the increased rate demonstrated and approved by both the DTSC and the CRWQCB.”

PG&E should demonstrate additional capacity before the order is amended to allow increased pumping rates. ADEQ understands that the order can be amended by the Executive Officer as soon as such a demonstration is made.

**(28) Report of Waste Discharge** – this should include Selenium as a contaminant of concern for the River. This should also include Beryllium for consistency with tables in the Monitoring and Reporting Program for this order.

**(44)** This sentence should be revised to include written comments in addition to comments at the public meeting, “The Board, in a public meeting *and in reviewing written comments received before the deadline*, heard and considered all comments pertaining to this discharge.”

## **A.1 Effluent Limitations**

**A.1 Effluent Limitations Typo A.1.** The first sentence currently reads “Representative samples of wastewater discharged **to from** the treatment system shall not contain constituents in excess of the limits indicated below.” ADEQ suggests that this sentence be rewritten to state, “Representative samples of treated, extracted groundwater discharged from the groundwater treatment system to the receiving water, the Colorado River shall not contain constituents in excess of the limits indicated below.”

**Constituent List** – ADEQ requests that the following constituents be added to this list: Selenium (possible impaired River with respect to this constituent), Temperature (summer) and Temperature (winter). Temperature limits or ranges are necessary to ensure that B(h) is satisfied which pertains to temperature impact to the receiving water and beneficial uses. This stretch of the River includes wildlife refuges and endangered species which may be sensitive to temperature changes. Without full EIS, these issues have not been fully assessed to date. Adding a temperature limitation range will protect the River from temperature pollution. *ADEQ requests that the CRWQCB consider using the Arizona numeric limit for increase in receiving water temperature (in this case the Colorado River) due to discharge: 3 °Celsius.*

**Hexavalent Chromium Effluent Limitations** – ADEQ requests that the Maximum Daily Effluent Limit for hexavalent chromium be set at the Aquatic and Wildlife Warm chronic

Standard of 11 ppb to reflect that this is an emergency measure that is proceeding without the benefit of usually required studies. This same standard is reflected in the California Toxics Rule and Part 131.38 (Federal Register Thursday May 18, 2000) where Freshwater numeric surface water standards for hexavalent chromium as listed as the California Toxics Rule, Maximum Concentration of 16 ppb and a criterion for continuous concentration of 11 ppb. **To be conservative, with consideration of the CA Toxics Rule, and to also to Arizona's standard of 11 ppb, ADEQ requests that the CRWQCB use a Maximum Daily Effluent Limit of 11 ppb for Cr<sup>6</sup> rather than 16.**

**Salinity** – The Surface Water Quality Objectives of the Water Quality Control Plan, Colorado River Basin, Region 7 has a numeric criteria for Salinity below Hoover Dam of 723 mg/L TDS.

The Maximum Effluent Limit in A.1 Effluent Limitations for TDS is 1000 mg/L. This limit is above the salinity standard in the Colorado Basin Plan for the stretch below Hoover Dam. ADEQ suggests that the limit be lowered to ensure consistency with the Water Quality Control Plan for the Colorado River Basin, Region 7 and Arizona standards.

**Selenium** -The Arizona Aquatic and Wildlife warm chronic standard for selenium is 2.0 ug/L (ppb) for total recoverable selenium (Appendix A of A.A.C R18-11). The acute standard is 20 ppb. We request that effluent limitations that are protective of the chronic standard be added to the order for the NPDES discharge to the Colorado River.

As stated earlier, The Colorado River from Hoover Dam to Lake Mohave is on Arizona's draft 303(d) List as impaired for selenium. This list is expected to be finalized by the end of this year. Lake Mohave is listed on the planning list in the draft report. Limited data indicate that Lake Mohave and lower reaches of the Colorado may be exceeding the selenium standard.

**Boron** – Arizona has a surface water quality standard for drinking water protected use for the Colorado for Boron of 630ug/L. We respectfully request that this standard be used as an effluent limitation for the NPDES discharge to the Colorado River.

**Effluent Limitations (2)** – The maximum daily flow shall not exceed 200 gpm. ADEQ requests that this be amended to 132 gpm until such time as PG&E submits adequate demonstration of treatment capacity and performance data to show that 200 gpm can be treated and effluent limitations met.

**C. Prohibitions** - Although the standard conditions include provisions that allow for by pass of treatment processes, it is unclear how these would apply to a groundwater pump and treat facility. ADEQ requests that prohibition 1 be reworded to prohibit any discharge of untreated wastewater to the Colorado River from the facility.

**D. Specifications (3)** – define “facility”. Here facility should include the treatment plant, conveyances and the outfall.

**E. Provisions (2) – Expiration date** of Order No. 0100. ADEQ respectfully requests that because this permit is being issued to allow an emergency activity which has been exempted from CEQA requirements, that only a short-term permit/order be issued. While 5 years is the normal permit term for renewal of NPDES permits, for this permit, ADEQ suggests that two years is appropriate for an emergency action.

ADEQ wishes to point out that all orders for this NOE should contain limited life spans and expiration dates that are consistent with two year period provided in documents which were the basis of the NOE to CEQA requirements.

**E. Provisions (11)(a) Representative Sampling** – ADEQ suggests that actual sampling locations be specified by the order.

**E. Provisions (21)** – ADEQ suggests that a Compliance Schedule be added to this and the two other orders that include items such as this 30 day submittal requirement for the Discharge Outfall Design Plans. Further this requirement should be specific with respect to several issues, such as the plans must clearly show the outfall location, indicate if the outfall will be submerged or above the river margin, indicate if the location discharges to a point in the River where there is an eddy with backflow, etc, and should provide the capacity of the conveyance and treatment systems.

**Proposed Order R7-2004-0103:**  
**Re-injection of Treated, Extracted Groundwater to the Aquifer**

**FACT SHEET** – ADEQ recommends that a separate fact sheet be prepared for this order.

**Items (24 and 25)- 200 gpm Injection Rate vs. Plant Treatment Capacity** – The order allows up to 200 gpm for injection. It is important to limit injection to the capacity of the treatment system which is currently 132 gpm, as proposed by PG&E.

The current language in the order reads, “The facility is designed to extract and treat 200 gpm of contaminated groundwater.” **This statement is inaccurate** based on the On-board Review meeting notes and information provided in the Consultative Workgroup meeting on August 19, 2004. **The facility is only designed to treat 132 gpm.** ADEQ asks that the injection rate be limited to 132 gpm until such time as PG&E demonstrates sufficient treatment capacity for 132 gpm and that the rate not be expanded beyond 132 gpm until additional treatment capacity is added to the system. This affects Item 24 (on page 3 of our copy which was transmitted to us by email). We ask that the RWQCB revise the sentence in (24) to reflect the actual *treatment capacity* of the system of 132 gpm.

**Item (25), page 3.** This same comment applies to the 200 gpm in this provision. ADEQ appreciates that the CRWQCB wishes to provide PG&E with a comfort factor in the event that additional extraction is needed to control the plume and supports this decision and is supportive of flexibility. This however, cannot be done without a parallel increase in the treatment capacity of the treatment plant. ADEQ requests that this provision be amended to state that the discharger/permittee “shall not discharge at a rate exceeding 132 gpm (the treatment plant capacity) until such time as additional treatment capacity has been achieved for an increased extraction rate and the increased rate approved by both the DTSC and the CRWQCB.”

PG&E should demonstrate additional capacity before the order is amended to allow increased pumping rates. ADEQ understands that the order can be amended by signature of the Executive Officer as soon as such a demonstration is made.

**Item (29), page 4 Beneficial Uses** – does this provision intend to say that the discharge/injection activities shall protect all beneficial uses of the Piute Hydrologic Unit or if it is just intended as a cross-reference to the Basin Plan?

**Report of Waste Discharge (page 4)** – This should include Selenium.

**A. Effluent Limitations (page 6)** – While cross-referencing might be a simpler fix (and may be implied by Provision D.2), given that each order may and can be implemented independently of

each other, **ADEQ recommends that Order R7-2004-0103** re-iterate the requirements for the treatment system effluent monitoring and effluent limitations for the NPDES discharge with the exception of the chromium limits. ADEQ supports that for injection to groundwater the average monthly and maximum daily effluent standards for injection to groundwater remain conservatively set at the proposed limits for total chromium - 50 ppb for the Maximum Daily Limit and 25 ppb for the average monthly limit. ADEQ requests that the maximum daily effluent limit for hexavalent chromium be revised from the proposed 16 ppb to 11 ppb, given the potential for hydrologic connection between groundwater and surface water.

**A.1. Selenium as an Effluent Limitation** - ADEQ requests that the effluent limitations be amended to add a limit, the maximum contaminant level (MCL) for selenium (0.01 mg/L as listed in the Water Quality Control Plan, Colorado Basin Region 7, General Surface Water Quality Objectives, General Objectives for municipal uses) as an effluent limitation for the injection stream. The Colorado River from Hoover Dam to Lake Mohave is on Arizona's draft 303(d) List as impaired for selenium. This list is expected to be finalized by the end of this year. Lake Mohave is listed on the planning list in the draft report. Limited data indicate that Lake Mohave and lower reaches of the Colorado may be exceeding the selenium standard (see attached table showing River sampling results). Discharge limitations for effluent re-injection to groundwater that have the potential to be in hydrologic connection with surface water should be protective with respect to selenium.

**Typo A.1.** The first sentence currently reads "Representative samples of wastewater discharged **to from** the treatment system shall not contain constituents in excess of the limits indicated below." ADEQ suggests that this sentence be rewritten to state, "Representative samples of treated, extracted groundwater discharged from the groundwater treatment system to the receiving aquifer shall not contain...."

**B. Prohibition (4) Reference to the design treatment capacity of the *disposal* system.** ADEQ is unsure what this prohibition means and requests that the order be clarified by the CRWQCB. ADEQ suggests that this prohibition specifically refer to the injection capacity for the injection wells and to the permeability and aquifer properties of the receiving aquifer. (For example state "The Re-injection rate(s) ***shall not exceed the capacity of the receiving aquifer*** in each injection well location.")

This statement should also reflect the performance capacity of the treatment system (rather than disposal system) – which is currently 132 gpm. ADEQ requests that B. Provision (4) include a statement "The discharger shall not discharge waste in excess of the design treatment capacity of the ***treatment and conveyance*** system."

**B. Prohibition (5)** – This should also include impact to beneficial uses of the receiving aquifer and surface waters that are in hydrologic connection with the receiving aquifer. ADEQ requests that this provision state “The discharge shall not impact any beneficial use of the receiving aquifer or receiving surface water.”

ADEQ requests that a statement be added at the end of the current provision “The discharge shall not cause degradation of any water supply” that states, “including water supplies located outside of California (i.e. in Arizona).”

**C. Specifications (2)** – “No changes in the type or amount of treatment chemicals added to the process water.....shall be made without written approval of the Regional Board’s Executive Officer” ADEQ suggests that the following be added to the end of this sentence “and the DTSC.”

**C. Specifications (2)** – “No changes in the type or amount of treatment chemicals added to the process water.....shall be made without written approval of the Regional Board’s Executive Officer” ADEQ suggests that the following be added to the end of this sentence “and the DTSC.”

**C. Specification (3)** – Add a definition for the term “facility” as used here, such as, “The facility (*consisting of the groundwater extraction system, treatment system, conveyance system and injection system*) shall be protected from any washout....”

**D. Provisions – what is the lifetime/duration of this order?** ADEQ does not see this specified under section D. or otherwise specified in Order No. R7-2004-0103. ADEQ requests that the order be issued for a limited period such as two years to reflect that this is an Interim Measure, not a final remedy.

(1) refers to a Permit renewal application but the term of the permit is not stated in the order.

**D. Provision (2) Monitoring and Reporting Requirements** –Order R7-2004-0103 does not include specific preliminary monitoring requirements and tables for the new monitoring wells that are required to be installed in the injection area by Provision D(5) to monitor the Receiving Aquifer. These requirements should be added to the “Monitoring and Reporting Program No. R7-2004-0103” document.

**Provision D.(5) Monitoring Well Requirements: Number and Position of Monitoring Wells** – This comment is related to the above comment. Section D. Provisions (5) requires that a “representative” groundwater monitoring system be installed in the vicinity of the subsurface injection wells. The order requires installation of a minimum of one up gradient and two down

gradient monitoring wells with respect to the injection wells. It is important to note that up and down gradient may become relative terms once injection begins, if mounding occurs in the aquifer. ADEQ suggests that the order be amended to require a minimum number of wells per injection well location, and to require and describe the positioning of these wells with respect to the Colorado River and the injection point and compass points north, south, east and west rather than by the current groundwater gradient, which already is known to vary with depth in the aquifer even in the absence of pumping related to extraction and that will be further influenced by re-injection.

While we understand that additional wells will be proposed and negotiated with the involvement of the DTSC, ADEQ requests that a minimum number be included for each injection location in the order. ADEQ requests that the order require a minimum of 4 monitoring wells (each a nested well) for each injection well installed (the pattern is described further below).

**Provision D.(5) Injection Well Location and Lateral Separation** - The final location of the injection wells has not been decided and it is unknown if the wells will be located in close proximity to one another or not. Locations proposed in the document entitled *Draft Conceptual Workplan for Hydrogeologic Characterization and Well Installation on Parcel Number 650-151-06* are approximately 1000 feet apart. Given the potential horizontal separation between proposed injection sites, separate monitoring well sets should be specified by the order for each injection point to assess both groundwater elevation changes, and groundwater chemistry changes at varying depths in the Piute Hydrologic Unit. This means that nested wells should be required by the CRWQCB to ensure that the aquifer and the Colorado River are protected. (This appears to be the intent of PG&E based on the document, *Draft Conceptual Workplan for Hydrogeologic Characterization and Well Installation on Parcel Number 650-151-06, Interim Measures No. 3, Pacific Gas and Electric Company Topock Project.*)

**Provision D.(5) Monitoring Wells Between Injection Points and Colorado River** - ADEQ requests that the order be revised to specify that a minimum number of wells be installed between the injection well field and the Colorado River with *nested monitoring in multiple zones*, as is appropriate to gauge the influence of the injection on groundwater flow patterns, and groundwater gradients that are already influenced by salinity and temperature, and also the influence of re-injection on the plume configuration and chromium concentration contours.

Rather than a triangle, a diamond pattern may be more appropriate. Injection proposed under this order has the potential to influence the existing plume and it is important to monitor the influence of the injection on the groundwater system. This requirement for a minimum number of wells per injection point and a diamond pattern of monitoring is essential for good technical assessment of mounding and plume influence and also for technically assuring the public that

both groundwater and surface water resources are being protected during Interim Measure No.3 re-injection.

**Provision D.(5) and (6) Monitoring Frequency and Constituent List** – During interim measures it is important that the required groundwater monitoring program assess the performance of the system and be sufficient to allow observation of problematic groundwater chemistry changes prior to any potential influence on the Colorado River or adverse impact to beneficial uses of the aquifer. The monitoring frequency for these monitoring wells should be specified by the order and not left for future reports and proposals as currently required under **Provision (6)**.

The constituent list should also be specified by the order before approval and can easily be developed to mirror the treatment performance of the treatment plant and measurement of response in the receiving aquifer. Rather than waiting for a plan as indicated in Provision (6) ADEQ requests that RWQCB add a table for required monitoring of the injection system *monitoring wells* in the receiving aquifer that is similar to the table labeled Receiving Water Monitoring (for the Colorado River and the NPDES order) which pertains to monitoring in the Colorado River. The list of constituents for *receiving aquifer monitoring* should include temperature and selenium (due to potential connection between the River and the aquifer). The California MCL of 50 ppb for total chromium should be an important trigger for immediate response actions (which should be identified now).

ADEQ requests that CRWQCB require a weekly sampling schedule for the injection monitoring system which should *monitor response in the receiving aquifer* for the duration of the order with the understanding that the Executive Officer of the CRWQCB can and has the authority to later change the monitoring frequency if data trends indicate that monitoring is redundant and geochemistry has stabilized in response to injection. This decision should only be based on sufficient data gathered over time and should be justified by the data submitted by PG&E to the CRWQCB and DTSC.

Again, we ask that Receiving Aquifer monitoring be added to the “Monitoring and Reporting Requirements for R7-2004-0103 document.

**Provision D.(5) and (6) Contingency/Response Actions** – The order should require contingencies in the event that monitoring wells installed under D(5) to monitor the *receiving aquifer* and assess the impact of re-injection or *any other monitoring wells along the Colorado River* indicate that groundwater quality is being adversely impacted by injection or that injection is influencing the existing plume and causing the leading edge(s) of the plume to move towards the Colorado River or beneath the River.



Right now the order currently does not have any emergency provisions for adverse impact noted in the *receiving aquifer monitoring systems* that are required for the injection system (and that ADEQ is requesting be required for each injection well point rather than the entire system) or for monitoring wells that are already in place. *In fact the order does not presently specify **Receiving Aquifer Monitoring Requirements***. ADEQ requests that this be rectified before signature/approval of the order by the CRWQCB.

**Report of Waste Discharge (page 4)** – ADEQ suggests that Selenium be added to this list for Report of Waste Discharge along with appropriate Average and Maximum values. The Colorado River may be impaired with respect to Selenium, based on information in the 2002 CWA Section 303(d) List of Water Quality Limited Segments and other sources of information available to ADEQ, including recent sampling performed by the Arizona Department of Environmental Quality (ADEQ) and El Paso Natural Gas.

**Plume Delineation** – ADEQ is concerned that the injection wells appear to be screened for injection into the alluvium and top of the Red Fanglomerate (*Draft Conceptual Work Plan for Hydrogeologic Characterization and Well Installation on Parcel Number 650-151-06, dated July 19, 2004*). At this time, it appears to ADEQ based on the 6/14/04 *Draft Vertical Cross Section Showing Chromium Contours* and data from depth intervals of 90 and 100 feet bgs in well MW-36 that hexavalent chromium may be moving at depth in the aquifer along the top of the Red Fanglomerate or in the Fanglomerate and not following current groundwater flow contours.

(It is also important to note that the former injection well used for injecting cooling tower blowdown PGE08 was reportedly screened from 450 to 554 feet bgs. This depth is beneath the alluvium that is currently the focus of the groundwater monitoring program. Current investigations appear to halt at the Red Fanglomerate. ADEQ is unsure of how this relates to the current investigation and characterization activities and suggests that investigations should extend into this unit if it is fractured.)

While data from Figure 7 (Hydrogeologic Section B1 Average Groundwater Elevation Contours July 31, 2004) that has been corrected for temperature and salinity and suggests slight upward groundwater movement in the vicinity of well MW-36, concentration contours in the *Draft Vertical Cross Section Showing Chromium Contours* suggest that the Cr<sup>6</sup> plume may not be following the groundwater gradients that are depicted in Figure 7. For example, in spite of the upward gradient depicted in Figure 7, June 2004 data from well MW-36 changes from non-detect (<0.001 mg/L at 70 feet bgs) to 3.27 mg/L at 90 feet and 2.80 mg/L at 100 feet bgs (see *Chromium Sampling Results 2<sup>nd</sup> IM Sampling Event June 2004*). Both concentrations are significantly above the 0.05 mg/L CA drinking water standard for total chromium. This is an anomalous, marked and significant trend that suggests preferential pathways of movement may exist at depth, or that the plume may be denser than groundwater in the upper aquifer.

Groundwater quality data for wells 24A and 24B also show high concentrations of hexavalent chromium at depth – and are out of the area that is the focus of Interim Measure No.3. Well 24B is screened from 193.5 to 214 feet bgs (in the Fanglomerate) and samples from this well have contained Cr<sup>6</sup> concentrations in the 4,000-5,000 ppb range. Well 24A is screened from 104 to 124.5 and samples from this well have contained Cr<sup>6</sup> at concentrations of 2,000-3,000 ppb. These wells are located north of the former injection well PGE08 and the percolation ponds. This data suggests that the lower, vertical extent of the plume has not been determined, nor have the factors that are driving the plume downwards and outwards been identified.

The plume configuration (with a toe or leading edge apparently extending beneath the River and this edge still undefined at depth) is of concern to ADEQ with respect to the possibility of movement of the plume beneath the Colorado River and towards Arizona. (It is important to note that ADEQ has observed patterns of movement of hexavalent chromium at depth at other Cr<sup>6</sup> study projects in Arizona and have observed preferential pathways in aquifer materials that were more highly permeable and transmissive.)

It is possible that the plume movement may be influenced by topographic features and permeability changes at the contact of the alluvium with the top of the Red Fanglomerate, or fractures in this Unit. There is insufficient data to make any firm conclusions at this time.

In our opinion, it is possible if not likely that the Cr<sup>6</sup> plume has and is moving beneath the Colorado River, especially if the Red Fanglomerate extends continuously across to Arizona (as boring logs for Arizona wells suggest that it does). While MW-36 with the elevated concentrations at depth are reportedly located within the projected capture zone for Interim Measures No. 3 extraction wells and models suggest this well is within the zone of influence of extraction, **the meaning of this is limited by whether or not the plume is already beneath the River and** has reached Arizona. This is currently unknown.

Looking at the plume configuration in Chromium Sampling Results 2<sup>nd</sup> IM Sampling Event June 2004, it appears to ADEQ that Wells MW-30, MW-34, MW-27 and MW-32 do not monitor the deeper zones in the aquifer above the Red Fanglomerate or into the contact with this unit (as shown in the draft Vertical Cross Section previously referenced). **The eastern edge of the plume, therefore, has not been delineated at depth. Given recent detection of Cr<sup>6</sup> in groundwater water supply wells located in Arizona, on the eastern side of the Colorado River, Arizona requests that this matter immediately be investigated.**

Further, the vertical extent of contamination has not been defined at the location of MW-36. The deepest interval monitored in well MW-36 (100 feet bgs) has detectable Cr<sup>6</sup> at a

concentration of 2.80 mg/L, compared to the California MCL of 0.05 mg/L. ADEQ strongly suggests that a deeper monitoring interval be required at this location by DTSC.

The need for defining the plume at depth is also accentuated by the historic reports of Cr<sup>6</sup> concentrations in two abandoned production wells located 2000 feet northeast of the former PG&E percolation ponds at Bat Cave Wash and 1700 feet southwest of the Colorado River which were reportedly 1,480 ppb and 2,340 ppb in samples collected at a depth of approximately 120 feet bgs in the aquifer and groundwater data for wells MW-24A and 24B which contain Cr<sup>6</sup> at concentrations in the 3,000-5,000 ppb range.

**Data Gaps for Defining the Plume** - While ADEQ supports DTSC, PG&E and the CRWQCB in implementing emergency measures to protect the River, we must keep in mind that there are still data gaps and that these gaps must be immediately assessed to protect Arizona water supply wells and water resources. The sooner this is done the better.

Characterization of the hydrogeologic system will now be further complicated by increased extraction rates which will affect plume contours and apparent groundwater gradients, and will also be affected by re-injection. ADEQ requests that the CRWQCB, DTSC, CALEPA, and PG&E seriously assess the possibility of impact to Arizona groundwater resources and further delineate the eastern edge of the plume at depth, especially examining the potential preferential pathway that may exist at the contact of alluvium with the top of the Red Fanglomerate.

ADEQ requests that deeper monitoring wells be installed in the vicinity of wells MW-30, MW-34, MW-27, and MW-32. Deeper screened zones may also be needed at MW-28 and at MW-36 (Future characterization activities should also include deeper investigations in the vicinity of the former injection well PGE08 and the former percolation ponds and assessment of whether a preferential pathway potentially exists beneath Bat Cave Wash). *This should be a high priority.*

ADEQ requests that PG&E install discretely screened monitoring wells on the Arizona side of the Colorado River and that angle wells be considered that extend beneath the River, if needed. This step is necessary to assess whether the plume extends beneath the River and into Arizona aquifers. *Again, this should be a high priority.*

**D. Provisions (11)(a) – “representative sample”** ADEQ suggests that the order specify sampling locations for every required sample. We understand that locations have not yet been determined, so we suggest that the order can be issued with these locations identified as reserved and the requirement for them to be set within 30 days of order issuance.

**Proposed Order R7-2004-0080:**

**Reuse of Treated Extracted Groundwater in PG&E Cooling Towers/Cooling System and Discharge to Existing Lined Impoundments**

**Item (21)(a) – Discharge to Land.** This discharge is not only to land, but also to a receiving aquifer: in this case to the Piute Hydrologic Unit. ADEQ recommends this be revised to read “Discharge to Land and Receiving Aquifer”.

**Item (24) –** “The facility is designed to extract and treat 200 gpm of contaminated groundwater.” *This sentence is not correct.* The treatment system will reportedly be designed to treat 132 gpm of contaminated groundwater.

**Item (27) –** The Report of Waste Discharge application should be amended to include Selenium.

**Item (28) –** Indicate that the four existing Class II surface impoundments are triple-lined with two synthetic liners overlying a clay liner and a leachate collection and recovery/removal system (LCRS), or refer to Item (31) for design information.

**A. Specifications (3) –** define the phrase “new waste stream” as any waste stream not currently identified in the Report of Waste Discharge and this order.

**B. Prohibition (1) –** define “facility” – here does it mean the four lined impoundments or does it include the cooling towers and conveyance system?

**Typo B. Prohibition (2) –** Omit “The use of” at the beginning of the sentence. Begin the sentence with “Hazardous Chemicals...” and substitute term “may not” which is permissive to the term “shall not” .

**ADD New Prohibition (9) –** “The discharges to the impoundments specified by this order shall not cause or contribute to overtopping of the impoundments.”

**C. Provision (2) –** The document “Monitoring and Reporting Program R7-2004-0080” should contain requirements for monitoring of the LCRS sumps for rates indicative of **normal liner leakage and excessive liner leakage rates**. PG&E should be required to perform routine monitoring of the LCRS sumps and compare volumes in the sumps to pre-determined leakage rates. (There are standard calculations used for determining these leakage rates.)

For double lined surface impoundments, ADEQ requires characterization of fluids in the LCRS and contingency actions for exceeding the calculated limit for “normal liner leakage”. ADEQ requires contingency actions for exceeding these rates, such as performing liner leakage testing

and repairing identified leaks within a specified amount of time. Arizona has found that double lined systems often develop leaks and if left unaddressed, hydraulic head on the secondary liner can result in accelerated leakage into the vadose zone.

Arizona utilizes a daily liner leakage rate, calculated for the acreage of each surface impoundment. Comparisons of volumes accumulating in the LCRS sumps may be specified to be performed on daily, weekly or monthly frequencies.

**C. Provision (18)** – This provision refers to the **Imperial Hydrologic Unit**. ADEQ believes this is erroneous and should read as the **Piute Hydrologic Unit (based on other CRWQCB documents)**.

Our comments pertain to our review of the following documents:

1. *Fact Sheet for Application for National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements to Discharge to State Waters* (8 pages)
2. Standard Provision for NPDES Permit, October 1990 (11 pages)
3. Monitoring and Reporting Program No. R7-2004-0100 (NPDES permit – 9 pages)
4. R7-2004-0100: NDPEs discharge of treated extracted groundwater to the Colorado River (14 pages)
5. R7-2004-0103: Re-injection of treated, extracted groundwater to the Piute Hydrologic Unit (9 pages)
6. Monitoring and Reporting Program R7-2004-0103
7. R7-2004-0080: Reuse of extracted groundwater in the PG&E Topock cooling towers and discharge to existing triple lined, permitted impoundments (10 pages)
8. Monitoring and Reporting Program R7-2004-0080
9. *Notice of Exemption* Signed June 30, 2004 by Karen Baker of the Department of Toxic Substances Control (3 pages)
10. July 8, 2004 *Project Description, Interim Measures No. 3- Revision 1, PG&E Topock Compressor Station, Needles, California* (12 pages including attached report)
11. June 30, 2004 *Approval with Conditions, Interim Measures No. 3, dated June 21, 2004, Pacific Gas and Electric Company, Topock Compressor Station, Needles, California* (9 pages including figure of Proposed Well Locations)
12. CH2MHill *Draft Vertical Cross Section Showing Chromium Contours*, dated June 14, 2004
13. CH2MHill *Chromium Sampling Results, IM Field Investigations*
14. *Interim Measures June 2004 Well Chromium Results*
15. July 19, 2004 *Draft Conceptual Workplan for Hydrogeologic Characterization and Well Installation on Parcel Number 650-151-06, Interim Measures No. 3, Pacific Gas and Electric Company Topock Project*

16. August 13, 2004 *Performance Monitoring Report No.8 Interim Measure No.2*, PG&E Topock Compressor Station, Needles, California.
17. Ecology and Environment, RCRA Facility Investigation (RFI) Report, February 2004
18. CH2MHill, *Draft Workplan for Assessing Background Metals Concentrations in Groundwater*, PG&E Topock Compressor Station and Vicinity, Needles, California, June 2004.
19. CH2MHill, *Groundwater and Surface Water Monitoring Report, Second Quarter 2004*, PG&E Topock Compressor Station, Needles, California, August 17, 2004.

Attachments: *Table 1 – EPNG July 2004 Raw Water Sampling Results*  
*Table 2 - Colorado River Sampling Results*  
*Chromium Sampling Results 2<sup>nd</sup> IM Sampling Event June 2004*  
*Draft Vertical Cross Section Showing Chromium Contours*  
*Hydrologic Section B1 Average Groundwater Elevation Contours*

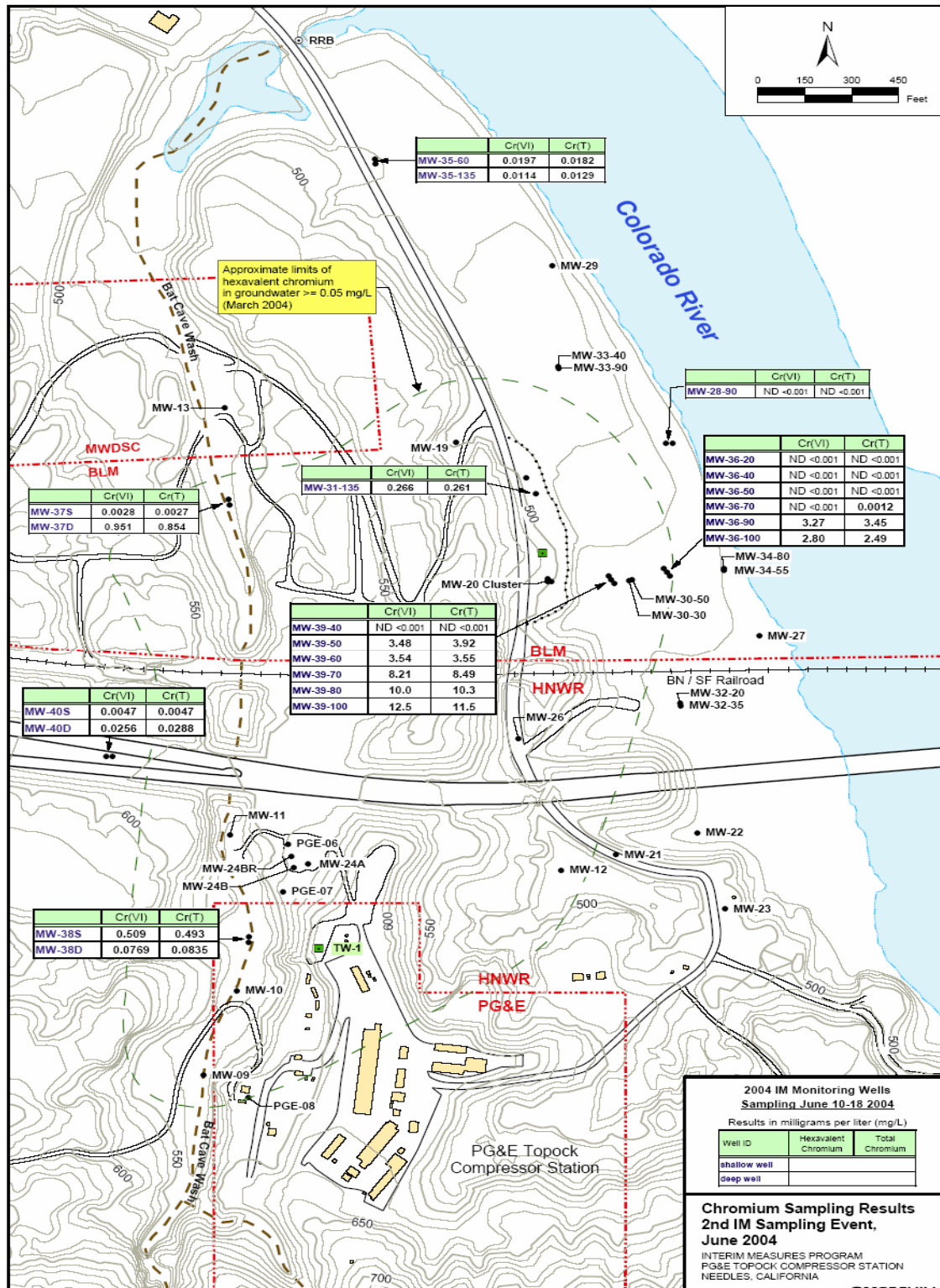
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*Table 1*

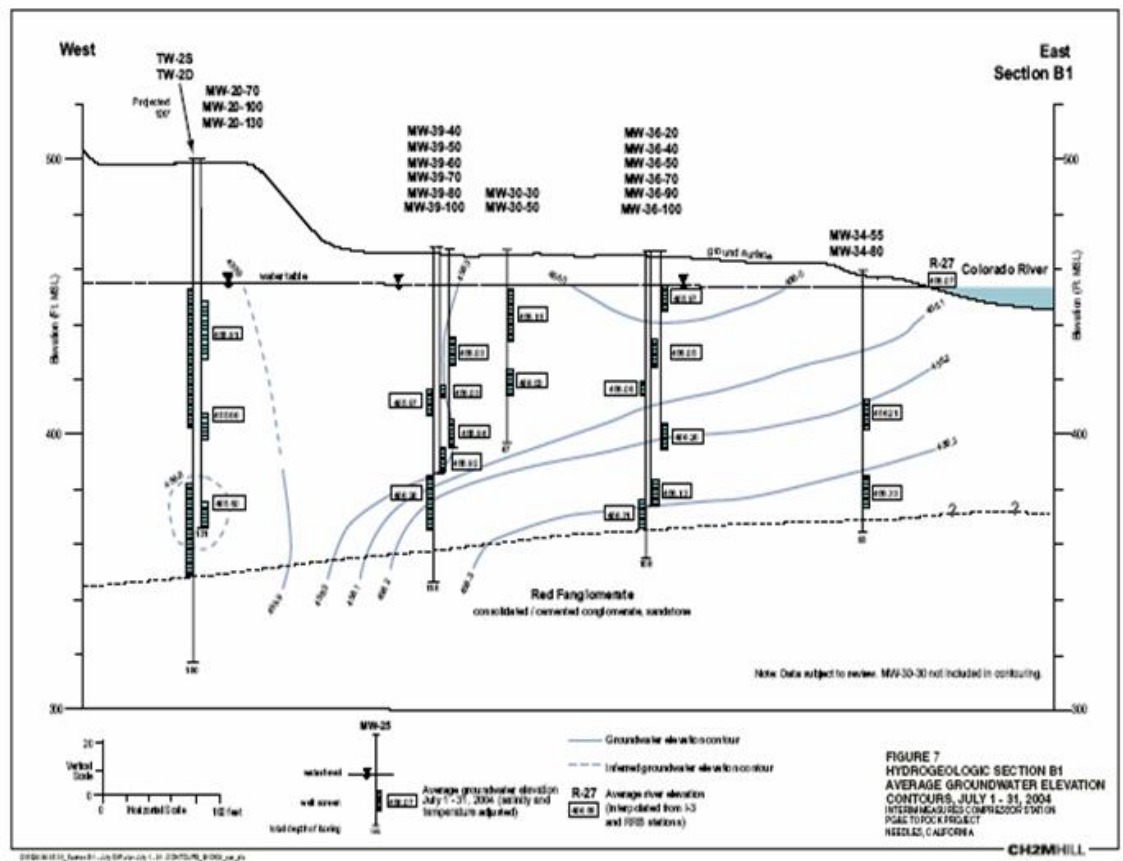
Sample Date	Mohave Raw Water (Water Supply)				Wastewater	
	West Well		East Well		Discharge to Outfall	
	Hex. Cr (ppb)	Total Cr (ppb)	Hex. Cr (ppb)	Total Cr (ppb)	Hex. Cr (ppb)	Total Cr (ppb)
7/7/2004	11.4	12	5.67	11	15.8	19
7/7/04D	11.3	NS	5.57	NS	15.8	NS
7/8/2004	11	13	9.5	11	16	18
7/12/2004	11	13	9.6	12	13	19
7/13/2004	11	13	9.8	12	15	17
7/14/2004	11	14	9.8	12	15	18
7/15/2004	11	13	9.1	11	14	17
7/19/2004	11	13	9.2	11	16	20
7/20/2004	11	14	7.4	12	17	21
7/21/2004	13	13	11	12	16	19
7/22/2004	11	12	9.2	11	18	20
7/29/04S	NS	NS	NS	NS	20	21
<b>Average</b>	<b>11.25</b>	<b>13</b>	<b>8.71</b>	<b>11.5</b>	<b>15.97</b>	<b>18.55</b>

Table 2

<b>Colorado River Surface Water Sample Collected Upstream of Outfall (at Moabi) and above Bat Cave Wash (EPNG Results)</b>				
Hexavalent				
Chromium	mg/L	<0.01	4/13/2004	Surface Water Sample at 1 meter depth
Total Chromium	mg/L	<0.001	4/13/2004	Surface Water Sample at 1 meter depth
Selenium	mg/L	0.0029	4/13/2004	Surface Water Sample at 1 meter depth
<b>Colorado River Surface Water Sample Collected Upstream of Outfall (Moabi) and above Bat Cave Wash (ADEQ Results)</b>				
Hexavalent				
Chromium	mg/L	<0.01	4/13/2004	Water Sample collected at 2.5 m depth
Boron (total)	mg/L	0.12	4/13/2004	Water Sample collected at 2.5 m depth
Chromium (dissolved)	mg/L	<0.01	4/13/2004	Water Sample collected at 2.5 m depth
Chromium (total)	mg/L	<0.01	4/13/2004	Water Sample collected at 2.5 m depth
Selenium	mg/L	<0.002	4/13/2004	Water Sample collected at 2.5 m depth
Total Dissolved Solids	mg/L	658	4/13/2004	Water Sample collected at 2.5 m depth
<b>Colorado River Surface Water Sample Collected 1/2 mile Upstream of EPNG Outfall (EPNG Results)</b>				
Total Dissolved Solids				
Solids	mg/L	1700	4/13/2004	Surface Sample collected at 2 meter depth
Hexavalent				
Chromium	mg/L	<0.01	4/13/2004	Surface Sample collected at 2 meter depth
Boron	mg/L	0.16	4/13/2004	Surface Sample collected at 2 meter depth
Chromium	mg/L	<0.001	4/13/2004	Surface Sample collected at 2 meter depth
Selenium	mg/L	0.0029	4/13/2004	Surface Sample collected at 2 meter depth







## Hydrogeologic Cross-Section

